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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/725,199

12/01/2003

Stephen G. Evangelides JR.

9005/41

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09/21/2006

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EXAMINER

HUGHES, DEANDRA M

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 09/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/725,199	EVANGELIDES ET AL.	
	Examiner	Art Unit	
	Deandra M. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/22/06 have been fully considered but they are not persuasive. Applicant argues the following.

- (A) "Srikant does not disclose that the pump source provides pump energy to the optical fiber span nearest the land-based transmission terminal." (pg. 10, lines 2-4)
- (B) "To the best of Applicant's understanding, the Examiner appears to be asserting that Dennis shows a portion of the optical fiber transmission path connected to the transmission terminal." (pg. 10, lines 1-5 of 3rd full paragraph)
- (C) "...in Sirkant the optical fiber 24 is not disclosed as being connected to the transmission terminal." (last 2 lines of pg. 10)
- (D) There is no motivation to combine Srikant and Dennis (1st full paragraph, pg. 11)
- (E) The combination of Srikant and Dennis is based on hindsight (last paragraph of pg. 11).

Argument (A) is unconvincing because providing a pump source to the optical fiber span nearest the land-based transmission terminal is not claimed.

Argument (B) is unconvincing because never asserted the statement as is incorrectly paraphrased by Applicant. The Examiner clearly stated her position on pg. 4 of the Office Action dated 5/26/05. To reiterate, "...Dennis teaches coupling a Raman amplifier (i.e., the first portion of the transmission path) to a transmitting terminal (fig. 11, #654 via #650).

Argument (C) is convincing. However, it does not put the application in condition for allowance. The Examiner stated the same on page 3, section 3 of the office action dated 5/26/05. Hence, the Examiner made a 103(a) rather than a 102(a) rejection.

In response to applicant's argument (D) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it is well established in the art that optical communication systems include transmitters, receivers, and amplifiers, among other devices.

In response to applicant's argument (E) that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Double Patenting

2. The following claims are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the respective claims outlined in the table below of copending Application No. 10/313,965 in view of admitted prior art.

Instant Application: 10/725,199	Conflicting Application: 10/313,965
1-3	10-12, respectively
4-8	14-18, respectively
9-11	36-38, respectively
12-13	40-41, respectively
14-15	43-44, respectively
16-17	47
18-19	48
20-23	1-4, respectively
24-29	5
31-34	6-9, respectively

The conflicting application (10/313,965) does not specifically claim increasing the Raman gain supplied to the optical signal in response to an increase in optical loss due to a cable repair. However, the admitted prior art of the instant application (10/725,199) teaches cable repair inherently increases optical loss (paragraph [0007]) and optical amplifiers provide amplification to optical signals to overcome optical loss (paragraph [0003]). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to increase the gain of an optical amplifier to overcome the increase in optical loss due to a cable repair.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Srikant (US 2003/0030891 filed Jun. 28, 2002) in view of Dennis (US 6,633,712 filed Mar. 16, 2001).

The method claims grouped below are merely the method of normal operations of the apparatus as claimed.

With regard to claims 1-2, 4, 9-10, 20, Srikant discloses a first portion of an optical transmission path (20) comprising:

- second end coupled to a first of a plurality of optical amplifiers (30);
- and a pump source (22) providing pump energy to said first portion of the optical transmission path at one or more wavelengths less than a signal wavelength to provide Raman gain in the first portion at the signal wavelength (this is the well known Stokes shift; further, it is disclosed in paragraph [0005]).

However, Sirkant does not specifically disclose a first portion of the optical transmission path having a first end coupled to the transmitting terminal. However, Dennis teaches coupling a Raman amplifier (i.e., the first portion of the transmission path) to a transmitting terminal (fig. 11, #654 via #650). It would have been obvious to one of

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ordinary skill in the art (e.g., an optical engineer) to couple the Raman amplifier to a transmitter for the advantage of building an optical communication system.

Also, Sirkant does not specifically disclose that distance by which the plurality of optical amplifiers is spaced apart along the transmission path is less than the length of the first portion of the transmission path, that is, the portion of the transmission path that imparts Raman gain. However, Dennis teaches varying transmission path length of hybrid Raman amplifiers to enhance gain effects (entire patent; see also col. 8, lines 50-60). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to ensure that the distance between the amplifiers is less than the length of the Raman amplifier for the advantage of flattening the gain of the optical communication path.

Further, Sirkant does not specifically claim increasing the Raman gain supplied to the optical signal in response to an increase in optical loss due to a cable repair. However, the admitted prior art teaches cable repair inherently increases optical loss (paragraph [0007]) and optical amplifiers provide amplification to optical signals to overcome optical loss (paragraph [0003]). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to increase the gain of an optical amplifier to overcome the increase in optical loss due to a cable repair.

With regard to claims 21 and 30, Srikant discloses additional serially connected Raman amplifiers (paragraph [0030]).

With regard to claims 16-19 and 24-29, the pluralities of amplifiers (#30 and #40) are EDFAs.

With regard to claims 3, 11, 22, the Raman amplifier, 20, would inherently have a positive gain tilt due to the nature of Raman amplification. Shorter wavelengths amplify wavelengths approximately 100nm away, thereby depleting the power of the shorter wavelengths. This would inherently result in longer wavelengths with higher power than the lower wavelengths. As a result, the gain would have a positive tilt.

With regard to claim 23, it is well known in the art that gain saturation inherently decreases the amplification factor (see Agrawal, pg. 229; lines 2-4). Consequently, it would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to avoid providing a saturating signal to the first optical amplifier for the advantage of optimizing the amplification factor.

With regard to claims 5-6, 12-13, 31-32, Dennis teaches a pump source co-propagating with the pump signal (fig. 11, #612). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to co-propagate the pump signal for the advantage of mitigating detrimental non-linear effects.

With regard to claims 7-8, 14-15, 33-34, Dennis teaches coupling a Raman amplifier with a counter-propagating pump (632) between the receiver and a previous optical amplifier (fig. 11, #660). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to couple a Raman amplifier between the receiver and the previous optical amplifier for the advantage of increasing the signal power thereby enabling detection by the receiver.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Deandra M Hughes
Primary Examiner
Art Unit 3663